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| **1. Name: Patricia Brooks** | **2. Target Grade/Student Level for this Lesson:**  **Grade 5 ~ General Ed** |
| **3. Date: March 24, 2018** | **4. P Credit Course Title: Energy, Water and Waste: Intergrating Themes of Sustainability into Your Classroom** |
| **5. Lesson Topic (Theme, Main Idea, or Essential Question):**  **Essential Question**: What are the effects of solar power technological changes over the last 50 years?  **Enduring Understanding**  •The role of solar power in human life for much of human history  • Solar energy has incredible potential for growth and may affect multiple areas of society | |
| **6. Vocabulary Words:**  **Solar cells**~ thin layers of silicon covered with special glass or plastic  **Solar thin film** ~ light absorbing materials that are rolled, sprayed or painted onto rooftops  **Thermal solar** ~ mirrors or panels containing tiny tubes filled with water that absorb heat from the sun.  **Passive solar** ~ the heat of the sun is used directly | |
| **7. Lesson Objective(s):**  Objective: Students will be able understand, that most solar power is generated by absorbing light energy from the sun and converting it into electricity.  **Science learning standards**:  4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.  SC.5.P.10.0 Investigate and describe some basic forms of energy including light, heat, forms of energy including light, heat, sound, electrical, chemical and mechanical  SC.4.P.10.1 Observe and describe some basic forms of energy including light, heat, sound, electrical and the energy of motion  SC.B.1.1.1 Knows that the Sun supplies heat and energy to the Earth.  SC.B.1.1.2 Knows that light can pass through some objects and not others.  SC.H.1.1.1 Knows that in order to learn, it is important to observe the same things often and compare them. SC.H.1.1.5 Uses senses, tools and instruments to obtain information from surroundings  **Common Core State Standards**  **RI.5.1** Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.  RI.5.2Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.  RI.5.3 Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text..  RI.5.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.  **W.5.1** Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5-LS1-1)  **SL.5.5** Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes | |
| **8. Sources: (Primary)**  This is a video showing how Solar energy works as well as it's pros and cons  <https://ed.ted.com/on/VBTZ9To1> What is Solar Energy? <https://www.youtube.com/watch?v=inPtRWtvDaM> | |
| **9. Student Engagement Activities:**  Step1 Students fill out workhseet  Macintosh HD:Users:admin:Desktop:solar-energy-physical-science-third.gif  Or  Setting: (Outside) Students take a few minutes to be still outside in the sunlight and just feel the sunlight  Next students jot down in their note books:   * What they saw and felt as they stood in the sun   Building a Solar Oven  <https://www.education.com/science-fair/article/design-solar-cooker/> | |
| **10. Student Assessment:**  Students summarize article by referring back to the objective and list facts how solar power is generated by absorbing light energy from the sun and converting it into electricity.    **10a. Rubric Assessment Exit Ticket**   |  |  |  | | --- | --- | --- | | **2 Points**  **Students summarize using 2 from article to support how solar power is generated** | **1 point**  **Student summarize using1 facts and support how solar power id generated** | **0 Point**  **Students showed no evidence of understanding** |   **11. Lesson Design:**  1. Students take a few minutes to fill out worksheet (box 9)  Discover how we use the power of the sun, and complete this worksheet about an important renewable energy source.  2. Which does the sun warm most in one hour, soil, air or water?  2a.What is solar energy? <http://www.ducksters.com/science/environment/solar_power.php>  3. Provide students with the definition of, Solar energy is the most abundant renewable energy source in the world. Solar energy systems refer to technologies that convert the sun's heat or light to another form of energy for use.  4. Students learn how the sun can be used for energy. They learn about passive solar heating, lighting and cooking, and active solar engineering technologies (such as photovoltaic arrays and concentrating mirrors) that generate electricity.  5. Students investigate the thermal energy storage capacities of test materials. They learn about radiation and convection as they build a model solar water heater and determine how much it can heat water in a given amount of time. In another activity, students build and compare the performance of four solar cooker designs. In an associated literacy activity, students investigate how people live "off the grid" using solar power.  6.. Power Point Presentation ~Solar power (cub\_solarenergy\_lesson01)  Separate attachment  Students read solar energy pdf. (see attached)    **References (worksheets)**  https://www.education.com/worksheet/article/definition-of-energy/  **© \_2\_0\_1\_1\_ \_T\_h\_e\_ \_N\_E\_E\_D\_ \_P\_r\_o\_j\_e\_c\_t\_ \_P\_.\_O\_.\_ \_B\_o\_x\_ \_1\_0\_1\_0\_1\_,\_ \_M\_a\_n\_a\_s\_s\_a\_s\_,\_ \_V\_A\_ \_2\_0\_1\_0\_8\_ \_1\_.\_8\_0\_0\_.\_8\_7\_5\_.\_5\_0\_2\_9\_ \_w\_w\_w\_.\_N\_E\_E\_D\_.\_o\_r\_g\_ \_** | |